



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0661; Project Identifier AD-2020-01349-E; Amendment 39-21792; AD 2021-22-19]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Pratt & Whitney Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** The FAA is superseding Airworthiness Directive (AD) 2011-07-02 for all Pratt & Whitney (P&W) JT8D-209, JT8D-217, JT8D-217A, JT8D-217C, and JT8D-219 model turbofan engines. AD 2011-07-02 required initial and repetitive torque inspections of the 3rd-stage and 4th-stage low-pressure turbine (LPT) blades. AD 2011-07-02 also required replacement of the LPT blade if wear limits are exceeded, replacement of the LPT-to-exhaust case bolts and nuts, and installation of crushable sleeve spacers on the bolts. This AD was prompted by a report of an MD-82 airplane, equipped with a JT8D-217C model turbofan engine, experiencing an engine surge that resulted in the fracture of the LPT blade and uncontained release of the LPT blade. This AD retains certain requirements of AD 2011-07-02, while revising the inspection thresholds and replacement intervals for the 3rd-stage and 4th-stage LPT blades. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this final rule, contact Pratt & Whitney, 400 Main Street, East Hartford, CT 06118; phone: (800) 565-0140; email: [help24@prattwhitney.com](mailto:help24@prattwhitney.com); website: <https://fleetcare.prattwhitney.com>. You may view

this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759. It is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0661.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0661; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Nicholas Paine, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7116; fax: (781) 238-7199; email: [nicholas.j.paine@faa.gov](mailto:nicholas.j.paine@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Background**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2011-07-02, Amendment 39-16639 (76 FR 16526, March 24, 2011), (AD 2011-07-02). AD 2011-07-02 applied to all P&W JT8D-209, JT8D-217, JT8D-217A, JT8D-217C, and JT8D-219 model turbofan engines. The NPRM published in the *Federal Register* on August 27, 2021 (86 FR 48080). The NPRM was prompted by a report of an MD-82 airplane, equipped with JT8D-217C model turbofan engines that, on approach to Taipei Songshan Airport, experienced an engine surge on the number one engine resulting in LPT blade fracture and uncontained LPT blade failure. An inspection by the manufacturer determined that this event was caused by shroud notch wear of the LPT blades, which led to changes in the vibration mode and subsequent high-cycle fatigue of the airfoil. In addition to this event, the FAA received reports of five events that involved uncontained failure of the LPT blades on the affected engines. Based on its investigation of these events, P&W determined that revised or more restrictive inspection

thresholds and replacement intervals of the 3rd-stage and 4th-stage LPT blades are necessary and revised its service information accordingly. In the NPRM, the FAA proposed to require an initial torque inspection of certain 3rd-stage LPT blades and repetitive torque inspections of 4th-stage LPT blades for shroud notch wear at revised inspection thresholds and intervals. In the NPRM, the FAA also proposed to require replacement of the 3rd-stage and 4th-stage LPT blades before accumulating 5,000 hours time-in-service.

## **Discussion of Final Airworthiness Directive**

### **Comments**

The FAA received comments from one commenter. The Boeing Company supported the NPRM without change.

### **Conclusion**

The FAA reviewed the relevant data, considered the comment received, and determined that air safety requires adopting the AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. This AD is adopted as proposed in the NPRM.

### **Related Service Information under 1 CFR Part 51**

The FAA reviewed Pratt & Whitney Alert Service Bulletin (ASB) No. JT8D A6224, Revision No. 7, dated August 26, 2019. This service information specifies procedures for the initial and repetitive torque inspections of the 3rd-stage and 4th-stage LPT blades for shroud notch wear at revised inspection thresholds and intervals. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

### **Other Related Service Information**

The FAA reviewed Pratt & Whitney ASB No. JT8D A6494, Revision No. 1, dated January 26, 2010, Pratt & Whitney ASB JT8D A6507, dated November 2, 2020, and Sections 72-53-12 through 72-53-13 of Pratt & Whitney Engine Maintenance Manual (EMM), Part No. 773128, Revision 107, dated October 15, 2020. Pratt & Whitney ASB No. JT8D A6494, Revision No. 1, dated January 26, 2010, describes procedures for replacing the LPT-to-exhaust case bolts and nuts and installing the

crushable sleeve spacers. Pratt & Whitney ASB JT8D A6507, dated November 2, 2020, describes procedures for replacing the 3rd-stage and 4th-stage LPT blades. Sections 72-53-12 through 72-53-13 of Pratt & Whitney EMM, Part No. 773128, Revision 107, dated October 15, 2020, describe procedures for inspecting and repairing the 3rd-stage and 4th-stage LPT blades.

### **Costs of Compliance**

The FAA estimates that this AD affects 42 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Inspect 3rd-stage and 4th-stage LPT blades	1 work-hour x \$85 per hour = \$85	\$0	\$85	\$3,570
Replace 3rd-stage and 4th-stage LPT blades	150 work-hours x \$85 per hour = \$12,750	\$350,000	\$362,750	\$15,235,500
Replace the LPT-to-exhaust case bolts and nuts and install the crushable sleeve spacers	1.5 work-hours x \$85 per hour = 127.50	\$4,576	\$4,703.50	\$197,547

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements" Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority

because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

The FAA has determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **The Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive AD 2011-07-02, Amendment 39-16639 (76 FR 16526, March 24, 2011); and

- b. Adding the following new airworthiness directive:

**2021-22-19 Pratt & Whitney:** Amendment 39-21792; Docket No. FAA-2021-0661; Project Identifier AD-2020-01349-E.

#### **(a) Effective Date**

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

This AD replaces AD 2011-07-02, Amendment 39-16639 (76 FR 16526, March 24, 2011).

**(c) Applicability**

This AD applies to Pratt & Whitney (P&W) JT8D-209, JT8D-217, JT8D-217A, JT8D-217C, and JT8D-219 model turbofan engines.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

**(e) Unsafe Condition**

This AD was prompted by a report of an MD-82 airplane, equipped with a JT8D-217C model turbofan engine, experiencing an engine surge that resulted in the fracture of the low-pressure turbine (LPT) blade and uncontained release of the LPT blade. Five prior uncontained LPT blade failures were also reported on affected model turbofan engines. The FAA is issuing this AD to prevent LPT blade fracture and uncontained release of the LPT blade. The unsafe condition, if not addressed, could result in uncontained engine debris, damage to the engine, and damage to the aircraft.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) For JT8D-209, JT8D-217, and JT8D-217A model turbofan engines, within the compliance times specified in the Accomplishment Instructions, Part 1: JT8D-209, -217, -217A Engines (Part 1), paragraph 1.A., of P&W Alert Service Bulletin No. JT8D A6224, Revision No. 7, dated August 26, 2019 (the ASB), perform an initial torque inspection for shroud notch wear of the 3rd-stage LPT blades using the procedures in Part 1, paragraph 1, of the ASB.

(i) Thereafter, within the applicable reinspection interval specified in Table 1-Reinspection Interval for all 3rd Stage Blades, of the ASB, repeat the torque inspection for shroud notch wear required by paragraph (g)(1) of this AD.

(ii) If the results of the torque inspection required by paragraphs (g)(1) or (g)(1)(i) of this AD meet the criteria for engine removal specified in Table 1-Reinspection Interval for all 3rd Stage Blades, of the ASB, perform piece-part inspections in accordance with the Instructions for Continued Airworthiness (ICA) on all 3rd-stage LPT blades before exceeding 20 hours time-in-service (TIS) since the last torque inspection.

(2) For JT8D-209, JT8D-217, and JT8D-217A model turbofan engines, within the compliance times specified in Table A or Table B, of the ASB, as applicable, perform an initial torque inspection for shroud notch wear of the 4th-stage LPT blades using the procedures in Part 1, paragraph 1, of the ASB. Wherever the ASB refers to “Revision 7 Release Date” and “At SB Release Date,” use the effective date of this AD.

(i) For engines in which the last inspection prior to the effective date of this AD had a torque inspection result of less than 15 LB-IN on any 4th-stage LPT blade, perform piece-part inspections in accordance with the ICA on all 3rd-stage and 4th-stage LPT blades within 20 hours TIS after the effective date of this AD.

(ii) Thereafter, within the applicable reinspection interval specified in Table 2-Reinspection Interval for all 4th Stage Blades, of the ASB, repeat the torque inspection for shroud notch wear required by paragraph (g)(2) of this AD.

(iii) If the results of the torque inspection required by paragraphs (g)(2) or (g)(2)(ii) of this AD meet the criteria for engine removal specified in Table 2-Reinspection Interval for all 4th Stage Blades, of the ASB, perform piece-part inspections in accordance with the ICA on all 3rd-stage and 4th-stage LPT blades before exceeding 20 hours TIS since the last torque inspection.

(3) For JT8D-217C and JT8D-219 model turbofan engines, within the compliance times specified in Table A or Table B, of the ASB, as applicable, perform an initial torque inspection for shroud notch wear of the 4th-stage LPT blades using the procedures in the Accomplishment Instructions, Part 2: JT8D-217C, -219 Engines (Part 2), paragraph 1, of the ASB. Wherever the ASB refers to “Revision 7 Release Date” and “At SB Release Date,” use the effective date of this AD.

(i) For engines in which the last inspection prior to the effective date of this AD had a torque inspection result of less than 15 LB-IN on any 4th-stage LPT blade, perform

piece-part inspections in accordance with the ICA on all 3rd-stage and 4th-stage LPT blades within 20 hours TIS after the effective date of this AD.

(ii) Thereafter, within the reinspection interval specified in Table 3-Reinspection Interval for all 4th Stage Blades, of the ASB, repeat the torque inspection for shroud notch wear required by paragraph (g)(3) of this AD.

(iii) If the results of the torque inspection required by paragraph (g)(3) and (g)(3)(ii) of this AD meet the criteria for engine removal specified in Table 3-Reinspection Interval for all 4th Stage Blades, of the ASB, perform piece-part inspections in accordance with the ICA on all 3rd-stage and 4th-stage LPT blades before exceeding 20 hours TIS since the last torque inspection.

(4) At the first engine shop visit after January 1, 2023, or prior to accumulating 5,000 TIS on the 3rd-stage and 4th-stage LPT blades, whichever occurs later, but not to exceed 6 years after the effective date of the AD, replace the 3rd-stage and 4th-stage LPT blades with parts eligible for installation.

(5) Thereafter, prior to accumulating 5,000 hours TIS on the 3rd-stage and 4th-stage LPT blades since their last replacement, replace the 3rd-stage and 4th-stage LPT blades with parts eligible for installation.

(6) After every replacement of the 3rd-stage or 4th-stage LPT blades, perform initial and repetitive torque inspections of the 3rd-stage or 4th-stage LPT blades using, as applicable, the accomplishment instructions and compliance times in Part 1, paragraph 1, or Part 2, paragraph 1, of the ASB.

(i) If the results of the torque inspection required by paragraph (g)(6) of this AD meet the criteria for engine removal specified in Table 1, 2 or 3, of the ASB, as applicable, perform piece-part inspections in accordance with the ICA on all 3rd-stage and 4th-stage LPT blades before exceeding 20 hours TIS since the last torque inspection.

(ii) [Reserved]

(7) The initial inspection or the reinspection interval should not be reset unless the blades are refurbished. Whenever a used blade is reinstalled in a rotor, the previous used time should be subtracted from the initial inspection threshold.



(8) Whenever a refurbished or used blade is intermixed with zero hours time-since-new (TSN) blades in a rotor, use the lowest initial inspection threshold that is applicable.

(9) At the next accessibility to the LPT-to-exhaust case bolts and nuts after the effective date of this AD, do the following:

- (i) Replace the bolts with part number (P/N) MS9557-26 bolts;
- (ii) Replace the nuts with P/N 375095 nuts or P/N 490270 nuts; and
- (iii) Install crushable sleeve spacers, P/N 822903, under the head of the bolts.

Note 1 to paragraph (g): Guidance on replacing the 3rd-stage and 4th-stage LPT blades can be found in P&W ASB JT8D A6507, dated November 2, 2020.

Note 2 to paragraph (g): Guidance on replacing the LPT-to-exhaust case bolts and nuts and installing the crushable sleeve spacers can be found in P&W ASB No. JT8D A6494, Revision No. 1, dated January 26, 2010.

#### **(h) Definitions**

For the purpose of this AD:

(1) An “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(2) Accessibility to the LPT-to-exhaust case bolts refers to maintenance involving the inner turbine fan ducts being removed from the engine.

(3) Parts eligible for installation are 3rd-stage or 4th-stage LPT blades with less than 5,000 hours TIS.

(4) A “piece-part inspection” is when the blades are removed from the rotor.

(5) A “used blade” refers to a 3rd-stage or 4th-stage LPT blade that has more than zero hours TSN.

#### **(i) Credit for Previous Actions**

You may take credit for any initial torque inspection for shroud notch wear required by paragraphs (g)(1) through (3) of this AD if you performed the initial

inspection before the effective date of this AD using P&W ASB No. JT8D A6224, Revision No. 5, dated June 11, 2004, or Revision No. 6, dated May 3, 2007.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ECO Branch, send it to the attention of the person identified in paragraph (k) of this AD. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

For more information about this AD, contact Nicholas Paine, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7116; fax: (781) 238-7199; email: nicholas.j.paine@faa.gov.

**(l) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Pratt & Whitney Alert Service Bulletin No. JT8D A6224, Revision No. 7, dated August 26, 2019.

(ii) [Reserved]

(3) For service information identified in this AD, contact Pratt & Whitney, 400 Main Street, East Hartford, CT 06118; phone: (800) 565-0140; email: help24@prattwhitney.com; website: <https://fleetcare.prattwhitney.com>.

(4) You may view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on October 21, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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